UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

February 1, 1996

Ron Christofferson
Arizona Game & Fish Department
2221 West Greenway Road
Phoenix, AZ 85023-4399

Re: Proposed mine site, Florence, Arizona
AGFD# 02-16-95 (02)

Dear Mr. Christofferson,

I appreciated the chance to talk with you today and ask you a few questions regarding copper mining sites in Arizona. As we discussed, USEPA is currently reviewing a UIC permit application for a proposed in-situ copper mining operation in Florence, Arizona. As part of the review of this Class III underground injection well, we are required to consider possible impacts under other Federal laws.

This proposed operation will have a raffinate and pregnant solution pond, each approximately 1/2 acre in size, and 8 evaporation ponds totaling 110 acres. The proposed operation is "sulfate-based" vs. "cyanide-based". Attached is the estimated characteristics of the impoundment solutions and drawings of the proposed facility.

We are trying to determine if any level of protection is necessary to deflect use of the ponds by migratory birds and other animals. It would be very helpful if your agency provided us with a detailed level of protection required by your agency for facilities of this type and by relaying the general industry standards that apply to these types of facilities in Arizona. It would also be helpful if you could compare the solution characteristics of this proposed site with other facilities in Arizona that you have examined for protection requirements. Finally, I would appreciate your understanding of the "attractiveness" of sulfate-based ponds vs. other types of solution ponds.

Thank you for your attention to this matter. We want to insure that your concerns are reflected in our permitting process. At your convenience, I can be reached at (415) 744-1832.

Sincerely,

Judy L. Bloom
Sourcewater Protection Section

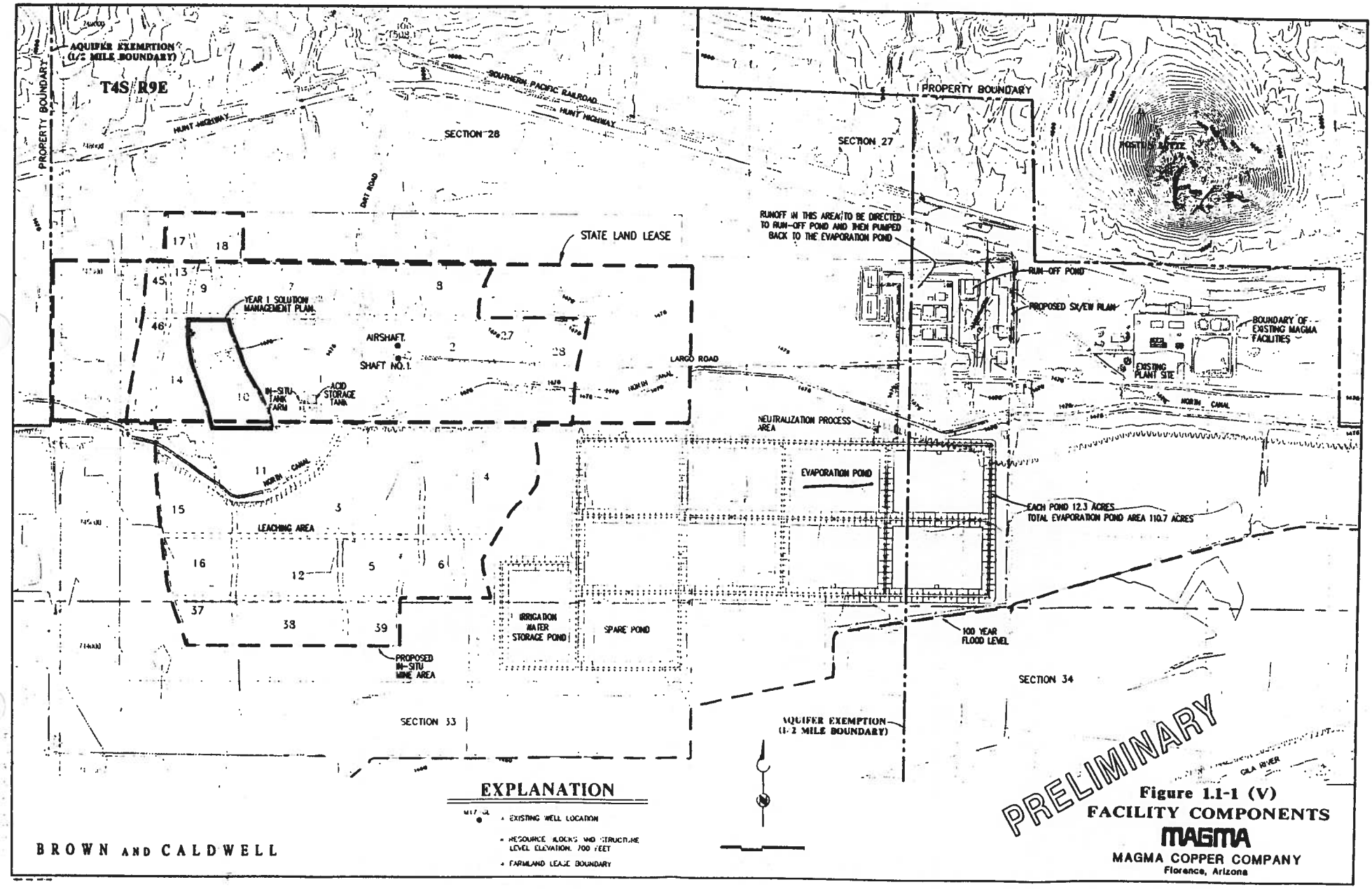

Figure 1.1-1 (V)
FACILITY COMPONENTS

I hope this shows up clearly!

Magma Copper Company
Florence Project
Estimated Characteristics of Process Impoundment Solutions

Impoundment/Tank	Pregnant Leach and Raffinate Ponds	Evaporation/Salt Pond	Storm Water/Spill Control Tank
Normal Condition	Always in use	Always in Use	Rarely used. Use during spills and storm events.
pH	1.7-2.2	6.5-7.2	6.5-8.5
Phosphorous, mg/l	60-100	Not Detected	0-100
Sulfate, g/l	90-110 90,000,000 ug/l	40-110	0-100
Aluminum, g/l	8-10 8,000,000 ug/l	35	0-10
Antimony, mg/l ug/l?	<0.1	0.2	<0.1
Arsenic, mg/l	5-6 5000 - 6000 ug/l	30	0-6
Barium, mg/l ?	<0.2	<1.0	<0.2
Calcium, g/l	0.5-0.7 500,000 - 700,000 ug/l	0.2	0-0.7
Chromium, mg/l	4-9 4000 - 9000 ug/l	120	0-9
Cobalt, mg/l	20-22 20,000 - 22,000 ug/l	20-22	0-22
Copper, g/l	0.2-4.0 200,000 - 400,000 ug/l	<1.0	0-4
Iron, g/l	1.5-2.0 1500000 - 2000000 ug/l	<1	0-2
Lead, mg/l ug/l? Pb	<1	<1	<1
Magnesium ?	9-11	Saturated Magnesium sulfate	0-2
Manganese, mg/l	1-2 1000 - 2000 ug/l ug/l	<1	0-2
Mercury, mg/l Hg	<0.01	<0.01	<0.01
Nickel, mg/l	20-25 20,000 - 25,000 ug/l	<1	0-25
Potassium, g/l	0.07-0.08 70,000 - 80,000 ug/l	0.25	0-0.08
Selenium, mg/l ? ug/l	<0.1	<0.1	<0.1
Silver, mg/l Ag ? ug/l	<0.01	<0.01	<0.01
Zinc, g/l	0.05-0.2 50,000 - 20,000	<0.2	0-0.2
TDS, g/l	90-120	Saturated magnesium sulfate	0-120
Vanadium? Cadmium?			
Estimated size, acres	<1	100	<0.1

Notes:

1. The evaporation pond will be equipped with evaporation sprayers which will deter birds from landing.
2. The run-off tank is used only in emergencies or during storm events and generally will be maintained empty.
3. Some analyses are listed in milligrams per liter (mg/100) and the other are listed in grams per liter (g/l).